

CLAIMS

1. A method for collecting, and optionally also detecting, a biological particle from air, the
5 method comprising the steps of:

10 1) providing a sample chamber and a first and a second electrode, the first and the second electrode and the sample chamber being so positioned that at least a part of the sample chamber is between the first and the second electrode,

15 2) providing an gaseous sample in sample chamber,

15 3) applying an first potential to the first electrode and a second potential to the second electrode, thus resulting in a potential difference and an electric field between the first and second electrode, to assist electrostatic collection, in the sample chamber, of a biological particle in the gaseous sample,

20 4) contacting the biological particle collected in the sample chamber with a first liquid, and

20 5) optionally, subjecting the collected biological particle to further analysis.

2. The method according to claim 1, wherein the first potential of the first electrode and
25 the second potential of the second electrode, and thus the electric field between the first and the second electrode, are selected so as to yield a capture efficiency of at least 50% for biological particles having an effective length in the interval from 1-10 micrometer.

3. The method according to claim 1 or 2, wherein the first and/or the second electrodes
30 have a substantial form chosen from the group of: a sheet, a plate, a disc, a wire, a rod, a point; or any combination thereof.

4. The method according to any of the preceding claims, wherein the first and a second electrode are separated by a distance being at the most 20 mm, preferably being at the
35 most 10 mm, more preferably being at the most 2 mm, and even more preferably 0.5 mm.

5. The method according to claim 1, wherein at least a part of the gaseous sample in sample chamber is positioned or flows between the first and the second electrode.

40 6. The method according to any of the preceding claims, wherein the biological particle comprises a component selected from the group consisting of a microorganism, a virus, a plant spore, and a fragment thereof.

7. The method according to claim 6, wherein microorganism is a bacterial spore.
8. The method according to claim 7, wherein the bacterial spore is formed by a bacterium
5 selected from the genus *Bacillus* and/or the genus *Clostridium*.
9. The method according to claim 8, wherein the bacterial spore is a spore formed by
Bacillus anthracis.
- 10 10. A chip for collection of biological particles, the chip comprising a sample chamber
comprising:
 - a sample chamber with a first opening in fluid connection with the surrounding air and
a second opening to form a fluid connection with a device, the sample chamber
comprising an gaseous sample,
- 15 - a first and a second electrode positioned at opposing sides of the sample chamber,
 - optionally, a biological particle attached to the first or the second electrode,
 - optionally, a first potential of the first electrode and a second potential of the second
electrode, and thus the electric field between the first and the second electrode, are
selected so as to yield a capture efficiency of at least 50% for biological particles
- 20 having an effective length in the interval from 1-10 micrometer.
11. The chip according to claim 10, wherein the electric field magnitude is in the range of
50-2000 V/mm.
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12. A device for collecting biological particles in a chip, the device comprising:
 - a chip site where the chip is to be located in order be functionally associated with the
device,
 - optionally, an electrical interface between the device and the chip for applying an
electrostatic field between the electrodes of the sample chamber,
- 30 - optionally, a flow generating means for providing an gaseous sample in the sample
chamber of the chip and being in fluid connection with the second opening of the
sample chamber when the chip is inserted in the device,
- optionally, means for controlling an gas flow through the sample chamber and/or a
liquid flow from the chamber into the sample chamber,
35 - optionally, a first reagent chamber for receiving and holding a first liquid reagent, the
first reagent chamber having at least one opening, which are in fluid connection with
the sample chamber when the chip is functionally associated with the device
- optionally, an electrical power supply for supplying power, e.g. to the flow generating
means, and
40 - a programmable unit comprising a software that effects that the device performs one
or more actions selected from the group consisting of:

- applying an electrical field between the first and second electrodes to assist electrostatic capturing, in the sample chamber, of biological particles in the gaseous sample,
- 5 - contacting collected biological particles in the sample chamber with a first liquid reagent, and
- performing further analysis of the collected biological particles.

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13. A system for collecting biological particles, the system comprising a chip according to any of claim 10-11 functionally associated with a device according to claim 12.

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